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First record of *Pristimantis crucifer* Boulenger, 1899 (Anura: Craugastoridae) from Colombia, Nariño Department

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Abstract: We report the first record of *Pristimantis crucifer* from Colombia. The new record from the Reserva Natural La Planada, department of Nariño, extends the species' range north by 63 km from the nearest locality in Ecuador and 305 km from the type locality.

Key words: La Planada; new record; Blue-thighed Rainfrog

Pristimantis Jiménez de la Espada, 1870 is one of the most extensive and diverse genera of amphibians (Hedges et al. 2008; Padial et al. 2014; Frost 2016) due to a combination of factors such as direct development (Reyes-Puig et al. 2010). The frogs of this genus comprise most of the communities of anurans in the Andean region of Colombia, Ecuador, and Peru (Padial et al. 2014; Mendoza et al. 2015). A total of 505 species are recognized worldwide (Frost 2016) and 211 species occur in Colombia (Acosta 2016). Boulenger (1899) described *P. crucifer* from Porvenir, province of Bolívar, Ecuador. Later records of the species are from 12 locations between 1,200 to 1,800 m above sea level (a.s.l.) in northwestern Ecuador (Figure 1), from the provinces of Bolivar, Cotopaxi, Imbabura, Pichincha and Carchi near the border with Colombia (Lynch & Duellman 1997; Yánez-Muñoz & Bejarano-Muñoz 2013; Frost 2016). Recent explorations in the Reserva Natural la Planada (RNLP), department of Nariño, southwestern Colombia resulted in three specimens of *Pristimantis crucifer*, the first record in the country.

In March and September 2015 we visited the Reserva Natural la Planada (01°13′11″ N, 077°59′05″ W, 1,800 m a.s.l.), San Isidro, department of Nariño, municipality of Ricaurte, near the border with Ecuador (Figure 1). The specimens were collected under permit number 126, issued by Corponariño, fixed in 10% formalin and preserved in 75% ethanol, and deposited in the collection of amphibians of the University of Nariño (PSO-CZ). The identification was based on Boulenger (1899), Lynch (1976), Lynch & Duellman (1997), and Frenkel et al. (2010), as well as examination by several experienced researchers.

We present a distribution map of the species showing the new locality and historical records from literature (Lynch & Duellman 1997; Yánez-Muñoz & Bejarano-Muñoz 2013). However, we did not include some records reported on AmphibiaWebEcuador by Frenkel et al. (2010) because the specimens were not examined.

Abbreviations: PSO-CZ = Museo de Historia Natural, Colección Herpetologica, University of Nariño; RNLP = Reserva Natural la Planada; SVL = snout-vent length.

We encountered three individuals of *Pristimantis crucifer* (PSO-CZ 2261, 2262, 2263) in the RNLP, where they were on vegetation of Melastomataceae and Rubiaceae, 60 to 80 cm above the ground, near small rushing creeks in a secondary forest with low vegetation (<1 m). The first record (PSO-CZ 2261) was on 25 March 2015 by RMA, and the second and third (PSO-CZ 2262, 2263) on 26 September 2015 by RMA and Maria Jose Sevilla, all at the same locality. All specimens were collected between 21:00 and 22:00 h. The individuals are recognized easily in life by the green body, reddish iris, conical tubercles above eyelids and heels, forearms and external borders of the tarsus and fingers with lateral fringes, and a blue patch in the groin and hidden surfaces of the thighs, mainly in adults (Figures 2–5) (Boulenger 1899; Lynch 1976; Lynch & Duellman 1997; Frenkel et al. 2010). One specimen (PSO-CZ 2262, Figure 6) exhibited a yellow wash surrounding the blue patches, similar to individuals from Mindo, Ecuador (Pablo Venegas pers. comm.). This characteristic can be present or absent in *P. crucifer* (Santiago Ron pers. comm.).

Based on the comparison by Yánez-Muñoz et al. (2014), among spiny green frogs from Ecuador, *Pristimantis crucifer* is similar to *P. appendiculatus* Werner, 1894, *P. eriphus* Lynch & Duellman, 1980, and *P. verecundus* Lynch & Burrowes, 1990 in Colombia. In life, *P. crucifer* differs from the others by the presence of a blue patch in the groin and hidden surfaces of the thighs. Moreover, *P. eriphus* is restricted to the Putumayo and eastern flank of the Andes

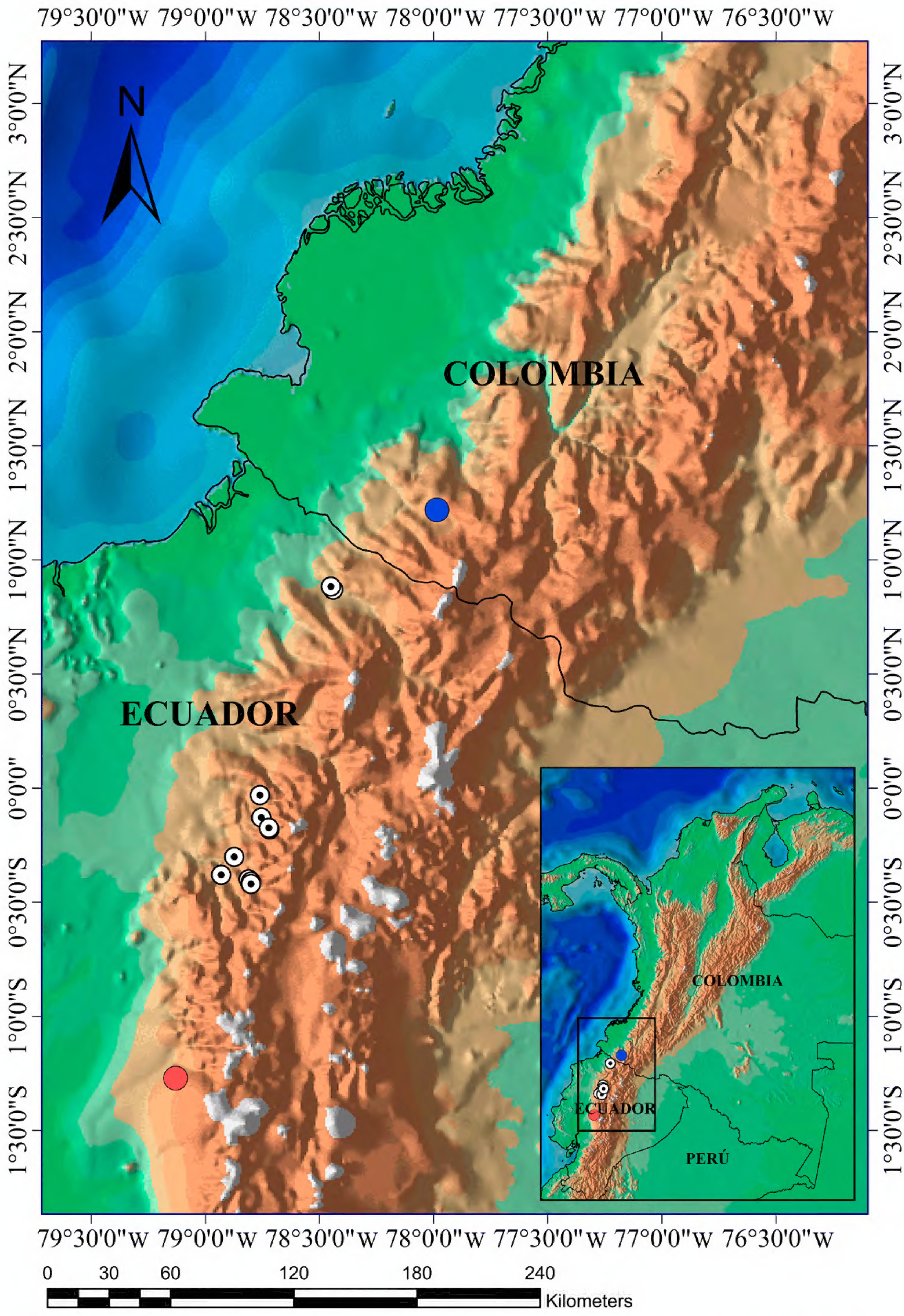

Figure 1. Distribution map of *Pristimantis crucifer*. The blue circle indicates the new record and locality in Colombia (Ricaurte, Reserva Natural la Planada, Nariño). The red circle indicates the type locality in Ecuador: Bolívar (Porvenir). ⊙ = Historical records in Ecuador (Lynch & Duellman 1997; Yánez-Muñoz & Bejarano-Muñoz 2013). Datum: WGS84.

Figures 2–5. Specimen in life of *Pristimantis crucifer* (PSO-CZ 2262, SVL=21.4 mm) from Reserva Natural la Planada, Nariño, Colombia. **2 and 3:** Dorsolateral view. **4:** Dorsal view. **5:** Ventral view showing the blue coloration in the groin and legs. Photos by RMA.

(Ruiz-Carranza et al. 1996; Mueses-Cisneros 2005). *Pristimantis appendiculatus* and *P. verecundus* are sympatric with *P. crucifer* in the RNLP (Lynch & Burrowes 1990; Ruiz-Carranza et al. 1996; Lynch 1998; Vargas-S & Castro-H 1999) and have coloration which varies from green to brown (Lynch 1971; Lynch & Burrowes 1990; Yánez-Muñoz & Bejarano-Muñoz 2013) but *P. appendiculatus* is distinguished by a fleshy proboscis at the tip of the snout and large tubercles on eyelids, between eyes and on limbs (Lynch 1971) and *P. verecundus* by a partial dorsolateral fold (absent in *P. crucifer*) snout subacuminate in dorsal view and rounded in lateral view (rounded in dorsal view and truncated in lateral view in *P. crucifer*) and males without nuptial pads (present in *P. crucifer*) (Lynch & Burrowes 1990; Lynch & Duellman 1997).

Lynch (1976) indicated that preserved specimens of *Pristimantis calcaratus* Boulenger, 1908 and *P. crucifer* may be confused, although the first is mainly coffee-colored, lacks blue coloration in the groin and legs, does not possess lateral fringes on the fingers, and the heel tubercles are more prominent. Although, *P. calcaratus* also occurs on the western flank of the western Cordillera of Colombia, it has been reported only from Risaralda to Cauca departments (Acosta 2016).

We report the first record of *Pristimantis crucifer* in Colombia and the first instance of the species as part of the frog community of the RNLP, located on the Pacific slope of the Andes. Previously, the species was known only from Ecuador, where the two records nearest to Colombia are in the provinces of Carchi and Imbabura (Lynch & Duellman 1997). The new record is 63 km north of the nearest reported locality and 305 km from the type locality in Bolivar, Ecuador (Figure 1). Frenkel et al. (2010) believed that the low abundance of *P. crucifer* may be because it is often mistaken for other species; more extensive explorations in the reserve and nearby localities may yield more specimens. More information is needed about its natural history in Colombia, given its small area of occurrence and threats to its habitat from anthropogenic actions such as agriculture (Lynch et al. 2004).

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Figure 6. Specimen in life of *Pristimantis crucifer* (PSO-CZ 2261, SVL=16,7 mm) showing the yellow coloration surrounding the blue in the groin. Photo by RMA.

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